Assessment of Banteng Grazing on Coastal Plains, Cobourg Peninsula: an Update on Bowman (1994)

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Abstract

Late 1993 dry season herbage cover was found to be significantly different between fenced and unfenced plots on the coastal plains at Smith Point, Cobourg Peninsula. These findings contrast markedly with the results of Bowman (1994) who found that at the same site there was no significant difference in the biomass of herbs between the fenced and unfenced plots over the three years (1988-1991) of his study. Comparison of Banteng *Bos javanicus* scat counts on the plains for 1988 and 1993 indicate that there had been an marked increase in the local density of Banteng at this site.

I report these data to make the simple point that experimental studies must be run for a sufficiently long time period to capture extreme or infrequent events, which may be of greater ecological significance than results recovered for "normal" years.

Introduction

Little is known about the impact of introduced ungulates (both feral and domestic) on the Northern Territory savanna environment. Even basic data on the removal of herbage is largely unquantified. Bowman (1994) found that, after three years of exclusion of Banteng *Bos javanicus* from fenced plots on the coastal calareous plains of Cobourg Peninsula, herbage biomass did not differ significantly from that in adjacent unfenced plots, to which Banteng had access. However, over the same time period, in the savanna-monsoon rainforest ecotone, significant differences in herbage biomass were recorded.

Here I report differences in the cover of herbs between the fenced and unfenced plots on the coastal plains at the end of the 1993 dry season. I undertook this study because of the concerns expressed by Gurig National Park rangers that utilisation of these plains by Banteng had increased significantly. Unfortunately I could not examine the impact of Banteng grazing at the monsoon rainforest boundary site because the exclosure used by Bowman was destroyed by cyclone "Neville" in 1992.

Methods

In December 1993 a reassessment of herbage cover was undertaken for 25 pairs of fenced and unfenced permanent subplots on the coastal sand plains at Smith Point, Cobourg Peninsula. The percentage cover of herbs by species was visually estimated by Braun-Blanquet cover classes. The plots had been harvested in 1991 by Bowman (1994), so cover reported here represents growth occurring over a 30 month period since harvesting. The cover scores were converted to percentage mid-points and means and standard errors were calculated for the fenced and unfenced plots. The effect of herbivore exclusion was determined by non-parametric Wilcoxon Rank Sum tests.

Counts of scats on the sandplains were made to determine if the density of Banteng scats was significantly different to 1988 densities (Bowman & Panton 1991). Scat density was determined from 25 quadrats, each measuring 10m x 20m, placed 50m apart on two parallel transects. These transects were in approximately the same location as those used by Bowman & Panton (1991). Wilcoxon tests were used to compare the 1988 and 1993 Banteng scat data for these transects.

Results

The Wilcoxon test revealed a highly significant difference between the herbage cover in the fenced and unfenced plots ($P > 0.0001$). The fenced plot had a mean herbage cover of 9.2% (*SE*, 1.7%) and the unfenced plots had a mean cover of 0.7% (*SE*, 0.18%) cover. Only six non-grass species were encountered in sampled plots and all except one, *Cassytha filiformis*, were common to both fenced and unfenced treatments.

Wilcoxon tests also revealed a highly significant ($p > 0.0001$) increase in the density of scats from 162 (*SE*, 33) ha^{-1} in 1988, to 526 (*SE*, 42) ha^{-1} in 1993. It is probable that the scats recorded on this survey were less than one year old, as seasonal changes between wet and dry season and the extent of Banteng trampling (Bowman & Panton 1991) on the sandplains would be conducive to the breakdown rather than preservation of scats.

Discussion

The results of this study are at variance with those of Bowman (1994) who concluded that there was no significant difference between the unfenced and fenced plots, after three years of Banteng exclusion from the latter, on the coastal plains at Smith Point. One likely explanation for these disparite findings is increased grazing pressure on the plains from Banteng since Bowman's (1994) study, as suggested by the greater density of scats in 1993. Aerial surveys in 1985 and 1989 (Bayliss & Yeomans 1989) detected some decrease in Banteng population, accounted for by off-take for disease control and trophy hunting; while

subsequent surveys in 1991, 1992 and 1993 (Saalfield & Chatto 1994) indicating a levelling of the population at around 1,200 to 1,800 head. These surveys detected no change in the distribution of Banteng between broad scale sampling areas.

The scat results, however, suggest that Banteng density has been subject to a substantial local fluctuation (assuming a direct relationship between herd size and density of scats). The perception by the Gurig National Park Board of an increased Banteng population in the Smith Point area, independent of this study, was such that the Board allocated funds to fence the airstrip due to the increased risk of light aircraft striking these animals when landing.

One possible cause of major fluctuations in Banteng numbers is movements due to changes in food supply. Bowman (1994) reported significant changes in herbage cover in the eucalypt savanna and savanna-monsoon rainforest ecotone communities following Banteng exclusion, suggesting the importance of these habitats in providing suitable forage for these mammals. Eucalypt savanna is the dominant vegetation community of the peninsula (Wilson *et al.* 1992), and is capable of supporting annual fires. R. Chatto and K. Saalfield (pers. comm.) observed extensive areas of intensely burnt savanna in the southern portions of the peninsula during their aerial surveys of October 1993. These observations contrasted with their impressions of a discontinuous fire pattern from previous surveys. It is probable that many of the Banteng from these burnt areas of the park were displaced to the unburnt north (e.g. Smith Point) in search of food.

This survey provides a cautionary note for the interpretation of studies on plant/feral animal interactions. It is possible that occasional extreme events, like that reported here, have greater deleterious effects on natural ecosystems than does the low to moderate continuous pressure that occurs normally. Extreme, and probably, irregular events of this type may help to explain rapid increases in soil erosion or weed invasion within otherwise stable environments.

References

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